

### **REMARKS/ARGUMENTS**

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1 and 90-121 are presently pending in this application, Claims 1 and 103 having been amended by the present amendment.

In the outstanding Office Action, Claims 1, 90-96, 100-110, 113-115 and 117-121 were rejected under 35 U.S.C. §103(a) as being unpatentable over Seyama et al. (U.S. Patent 5,586,006) in view of Ainslie et al. (U.S. Patent 4,418,857); and Claim 99 was rejected under 35 U.S.C. §103(a) as being unpatentable over Seyama et al. and Ainslie et al., and further in view of JP 58-030175 (hereinafter “JP ‘175”).

Claims 1 and 103 have been amended to clarify that the “at least one metal layer” is formed in the partially exposed portion of the pad structure after the opening exposing that portion of the pad structure is formed in the solder resist. These amendments are believed to find support in the specification, claims and drawings as originally filed, and no new matter is believed to be added thereby. If, however, the Examiner disagrees, the Examiner is invited to telephone the undersigned who will be happy to work in a joint effort to derive mutually satisfactory claim language.

Briefly, Claim 1 is directed to a package substrate and recites, *inter alia*, “a conductive connecting pin configured to establish an electrical connection with another substrate, the conductive connecting pin being *secured to the partially exposed portion of the pad structure via a solder, the solder being disposed over at least one metal layer formed in the partially exposed portion of the pad structure ..., wherein the at least one metal layer is formed in the partially exposed portion of the pad structure after the opening is formed in the solder resist.*” By forming one or more metal layers in the partially exposed portion of the pad structure after the opening exposing that portion of the pad structure is formed in the

solder resist, the metal layer *cannot* be formed entirely over the upper surface of the pad structure, and the solder is effectively prevented from seeping into an interface between the solder resist and the pad structure but restricted in the exposed portion of the pad structure, thereby allowing the solder resist to remain firmly attached to the pad structure and the conductive connecting pin to be securely held in its place.

It is respectfully submitted that amended Claim 1 now recites, *inter alia*, “a conductive connecting pin configured to establish an electrical connection with another substrate, the conductive connecting pin being secured to the partially exposed portion of the pad structure via a solder, *the solder being disposed over at least one metal layer formed in the partially exposed portion of the pad structure ..., wherein the at least one metal layer is formed in the partially exposed portion of the pad structure after the opening is formed in the solder resist*” (emphasis added in italic), and as discussed in the previous response, Seyama et al. merely shows a conductive pin 34 attached via solder to a pad 32 exposed through a resist, and Ainslie et al. simply shows a pad structure having a metal layer formed over its entire upper surface. Neither Seyama et al. nor Ainslie et al. teaches or suggests that a metal layer be formed in the partially exposed portion of the pad structure *after the opening is formed in the solder resist such that the metal layer would not extend entirely over the upper surface of the pad structure*, and their teachings even in combination are not believed to teach or suggest “a conductive connecting pin configured to establish an electrical connection with another substrate, the conductive connecting pin being *secured to the partially exposed portion of the pad structure via a solder, the solder being disposed over at least one metal layer formed inn the partially exposed portion of the pad structure ..., wherein the at least one metal layer is formed in the partially exposed portion of the pad structure after the opening is formed in the solder resist*” as recited in amended Claim 1 (emphasis added in

italic). Therefore, it is respectfully requested that the obviousness rejection based on Seyama et al. and Ainslie et al. be withdrawn.

JP '175 is cited simply for “constriction portion 601 having a diameter, which is smaller than the diameter of the outer portion,” and is not believed to teach or suggest “a conductive connecting pin configured to establish an electrical connection with another substrate, the conductive connecting pin being secured to the partially exposed portion of the pad structure via a solder, *the solder being disposed over at least one metal layer formed only within the partially exposed portion of the pad structure ..., wherein the at least one metal layer is formed in the partially exposed portion of the pad structure after the opening is formed in the solder resist*” as recited in amended Claim 1 (emphasis added in italic). As such, the structure recited in amended Claim 1 is also distinguishable over JP '175.

Because none of Seyama et al., Ainslie et al. and JP '175 discloses the conductive connecting pin structure as recited in amended Claim 1, their teachings even in combination are not believed to render the structure recited in amended Claim 1 obvious.

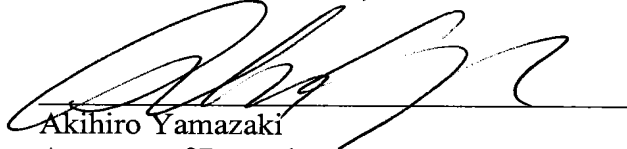
Claim 103 has been amended to recite “conductive connecting means for establishing an electrical connection with another substrate, the conductive connecting means being secured to the partially exposed portion of the pad structure via a solder, *the solder being disposed over at least one metal layer formed in the partially exposed portion of the pad structure ..., wherein the at least one metal layer is formed in the partially exposed portion of the pad structure after the opening is formed in the solder resist*” (emphasis added in italics), and is therefore distinguishable over Seyama et al., Ainslie et al. and JP '175.

Based on the foregoing discussions, Claims 1 and 103 are believed to be allowable. Furthermore, Claims 90-102 and 104-121 depend either Claim 1 or 103 and thus substantially the same reasons set forth above for Claims 1 and 103 are also applicable to these dependent claims. Thus, Claims 90-102 and 104-121 are believed to be allowable as well.

In view of the amendments and discussions presented above, the present application is believed to be in condition for allowance, and Applicants respectfully request an early and favorable action to the effect.

Respectfully submitted,

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